

Bldg. 2050  
W.D. 34518

**LIMITED LEAD BASED PAINT (LBP) SURVEY  
FOR THE  
SUSPECT COATINGS ASSOCIATED WITH THE STEEL BARREL ROOF  
STRUCTURES FOR HANGERS 1 AND 3 OF BUILDING 2050  
LOCATED ON  
FAIRCHILD AFB, WA 99011**

**Project No: S08-006.32  
Control Number: CER-F082  
Call Number: 27**

*Prepared for:*  
**92<sup>ND</sup> CES/CEO**  
*100 W Ent Street, Suite 310  
Fairchild AFB, WA 99011-9688*

*Prepared By*  
**Mountain Consulting Services LLC**  
*9922 East Montgomery Drive, Suite 9  
Spokane Valley, Washington 99206  
(509) 924-9236*

September 2, 2008

Mountain Consulting Services, LLC

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## 1.0 INTRODUCTION

Mr. Leo Erickson, representing the 92<sup>nd</sup> CES/CEOE contracted Mountain Consulting Services, LLC (Mountain Consulting) to conduct a **Limited lead based paint (LBP) survey** of suspect paint coatings associated with the interior steel barrel trusses of the roof structures for Hangers 1 and 3 of Building 2050 located on Fairchild AFB, Washington 99011.

This project was conducted to facilitate the installation of a fall protection mounting systems to the steel barrel trusses for Hangers 1 and 3 of Building 2050.

Mr. David A. Jones, Certified Washington State Lead Risk Assessor; Certification Number: WA 0567; Expiration Date: February 16, 2010 conducted the fieldwork portion of the survey on August 27, 2008. (See Appendix A for inspector certifications.) This survey process used surface-by-surface non-destructive measurements of suspected LBP coatings on the selected components by X-ray fluorescence (XRF) assay testing.

This survey complies with all applicable state and federal regulations and is provided to help the property owner determine the impact of lead-based paint and lead paint hazards for the scheduled demolition project.

## 2.0 X-RAY FLUORESCENCE TESTING

### 2.1 THEORY OF X-RAY FLUORESCENCE

Fluorescence can be defined as the emission (giving off) of electromagnetic waves by an atom when something excites it. An example of fluorescence is the visible light or glow given off by certain paints when a black light (a purple-looking ultraviolet light) is shone on them. This is the concept used in an X-ray lead-paint detector. The detector contains a source of radiation, a hermetically sealed radioactive isotope of cobalt ( $\text{Co}^{57}$ ) about the size of an aspirin tablet. The radiation is used to excite the atoms of a painted surface. As the surface returns to its normal state, it fluoresces.

The detector works something like a radio. Radio stations are assigned different frequencies, allowing the listener to select a single station. Lead fluoresces at a known frequency and, like a radio; the detector can be tuned to it. The fluorescence is sensed by the detector and displayed on a digital readout. The concentration of lead in the paint is expressed as mass (milligrams) per unit area (square centimeter).

## 2.2 XRF LEAD BASED PAINT SURVEY

Mountain Consulting collected thirteen (13) XRF test assays from the steel barrel roof structures for Hangers 1 and 3 of Building 2050 using the procedures outlined in the EPA's Standard Operating Procedures for Measurement of Lead in Paint using the Scitec Map-3 X-Ray Fluorescence Spectrometer (EPA 600/8-91/214; 1991), the revised Chapter 7 (November 1997) of HUD's Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing, and the Performance Characteristic Sheet for the Scitec MAP-4. Components tested during this survey were averaged using the HUD averaging system included in the ARM software used to generate the HUD tables located in Appendix F of this report.

Mountain Consulting used the Scitec (now EDAX®) MAP 4 XRF spectrum analyzer (Serial No: M41299) to perform nondestructive sampling for the included suspect LBP coatings.

Over time, the instrument's radiation source "decays," requiring longer times to reach standard precisions. Because of this, Mountain Consulting performs quality-control checks before, during, and after collecting data (depending on the length of the survey) to ensure that the MAP 4 is functioning properly and that assay results truly reflect lead levels at the sample points.

The instrument is calibrated using a standard from the National Institute of Standards and Technology backed by a common building material. Results of the averaged calibration readings are compared to the factory calibration results before the instrument was shipped to the owner.

Calibration results are plotted on a graph to detect trends that might indicate that the instrument is not working properly. If the result of a daily calibration check differs from the factory average by more than 0.2 mg/cm<sup>2</sup>, the instrument is not functioning properly or the radiation source may be too weak to provide accurate readings. See Appendix B for daily XRF calibration results.

An unlimited-test-length measurement was used to determine the lead concentration during the assays of each identified painted surface. The unlimited-length assay has an average precision (95% confidence) of about 0.2 mg/cm<sup>2</sup>. The action level for this study was set at the standard of 1.0 mg/cm<sup>2</sup>.

The unlimited-length test mode allows the inspector to continue to collect data until the action level (1.0 mg/cm<sup>2</sup>) is met within the set precision limit of the device. If the desired results are not achieved within a reasonable time, the inspector can end the assay, and the analyzer will report it as inconclusive.

In conjunction with the Advanced Report Manager software, the MAP 4 produces a comprehensive report based on the assay data.

Each sample is given a unique code that identifies the room number, wall number, component tested, substrate of the component, condition of the paint tested, substrate condition, and amount of lead detected in milligrams per square centimeter (mg/cm<sup>2</sup>).

## **2.3 HOMOGENEOUS COATINGS**

Homogeneous coatings are those considered to be consistent throughout an area based on color, texture, and construction era. For the purpose of this survey, homogeneous coatings were delineated using the construction era, coating color, and coating location as the primary considerations. Coating appearance, texture, and analytical results may support assumptions about each coating(s) homogeneity.

## **2.4 BULK PAINT SAMPLING**

Destructive bulk paint sampling was not conducted during this survey due to all XRF tested paint coatings proven to be lead containing.

## **3.0 RESULTS**

### **3.1 XRF LBP SURVEY**

LBP is defined by EPA regulations under Title X (Residential Lead-Based Paint Hazard Reduction Act of 1992) as containing lead concentrations above 1.0 mg/cm<sup>2</sup> when measured by a portable XRF instrument or 0.5% by weight (5,000 parts per million, or ppm) when measured by laboratory analysis. Since this project is for occupancy and limited renovation and not HUD target housing, HUD regulations do not apply, although the procedures for XRF testing can be utilized effectively for lead positive screens. Unfortunately negative XRF screenings for renovation or demolition projects may require additional testing protocol by bulk paint testing.

The Occupational Safety and Health Administration (OSHA) does not have a definition for LBP, if any amount of lead is present in a material, OSHA worker health-and-safety due diligence does apply.

**Positive Results** – A “positive” result refers to a sample that has a lead concentration greater than or equal to 1.0 mg/cm<sup>2</sup> by XRF analysis. All tested coatings produced results above the 1.0 mg/cm<sup>2</sup> threshold. See Appendix E for coating tested by XRF. See HUD data results in Appendix F for specific colors of tested paint films.

**Inconclusive Results** – “Inconclusive” refers to a sample that has a lead concentration from 0.80 mg/cm<sup>2</sup> through 1.20 mg/cm<sup>2</sup>. No inconclusive assay results were recorded during this investigation.

**Negative Results** – A “negative” result refers to a sample that has an average lead concentration of less than 1.0 mg/cm<sup>2</sup> by XRF analysis. No tested coatings produced results below the 1.0 mg/cm<sup>2</sup> threshold.

### 3.2 COATING CONDITION AND QUANTITIES

All brown, green and white steel metal roof structure coatings included with this survey are in fair to good conditions. The total quantity of LBP that will require impacting for this project was undefined at the time of this survey.

### 3.3 LEAD CONTAINING COATINGS

The paint associated with the following components contains lead above the regulatory limit by XRF paint testing protocols. Contractors working on or around these materials should be informed of the potential lead hazards:

Components	Paint Condition
Interior Brown Metal Trusses	Satisfactory Condition
Interior Green Metal Trusses	Satisfactory Condition
Interior White Metal truss Support Posts	Satisfactory Condition
Interior Green Metal truss Support Posts	Satisfactory Condition
Interior Brown Metal truss Support Posts	Satisfactory Condition

Components in satisfactory condition do not constitute lead hazards at the time of this inspection. Lead hazards could emerge if paint deteriorates or is impacted by renovation or demolition activities. Worker Health & Safety Lead Safe Work Practices should be employed for working with or around these components.

### 3.4 BULK PAINT SAMPLE RESULTS

The Occupational Safety and Health Administration (OSHA) and the Washington State Industrial Safety and Health Administration (WISHA) do not define by regulation a definition for lead based paints. Typically, negative and inconclusive XRF results are followed up with bulk paint sampling to determine the actual lead content of the identified coating. However, Mountain Consulting did not perform bulk paint sampling for this project because all tested coatings proved positive for lead base paint by XRF assay testing.

### 3.5 DISCUSSION OF LEAD REGULATIONS

The Occupational Safety and Health Administration (OSHA) 29 CFR 1926.62 and the Washington State Industrial Safety and Health Administration (WISHA) WAC 296-155 lead in construction standards do not define by regulation a definition for lead based paints, but do establish safe airborne exposure limits for employees working with lead containing materials to include paint films by PEL (permissible exposure limit).

#### Employee Protection:

Therefore, if any material contains lead above the limit of detection by Flame Atomic Absorption (FAA) analysis ( $>0.01$  %wt /  $>100$  ppm) or proven to be a LBP by XRF testing, then the abatement, renovation or demolition contractors must demonstrate provide worker health and safety practices.

This would typically include lead awareness training for all effected employees, establishing proper personnel protective equipment (PPE) to effected employees, proper demarcation of effected work area as required and the performance of initial and/or negative exposure assessment (NEA) lead air monitoring to determine employee exposure levels.

#### Waste Characterization:

Washington regulations requires that lead containing waste materials that contain grater than  $>0.01$  %wt or 100 ppm threshold be treated as hazardous waste, until waste stream TCLP bulk sampling prove otherwise.

Toxic Characteristic Leaching Procedure (TCLP) sampling and analysis must be conducted for any proposed demolition waste streams that will impact the identified coatings that contain greater than 100 ppm lead included in this project. If the analytical results of TCLP samples are below the Hazardous Waste Classification threshold limit of 5 ppm or 5 mg/l (milligrams per liter), the waste stream can be classified as Category I Low Lead Waste and can be disposed of in a landfill that accepts standard construction debris as per the requirements of 40 CFR Part 261 and WAC 173-303-110(5) for the determination of waste characterization.

It should be noted that recycling of components with lead based paints such as; metal door frames, window frames, etc... do not require TCLP sampling and analysis because the materials are not being disposed of. However, the owner is required to disclose to the recycling firm that lead based paint is present.

See Appendix E for information on the health effects of lead exposure.

## 4.0 CONCLUSIONS AND RECOMMENDATIONS

Our conclusions and recommendations are based strictly on information obtained from our site observations and from XRF assay findings during those survey activities. Consistent with our knowledge and understanding of environmental regulations, particularly as they apply to the potential liabilities associated with lead containing materials or coatings, we present the following conclusions and recommendations.

### 4.1 CONCLUSIONS

All tested roof structure and support post coatings included with this survey were proven to contain lead above regulatory thresholds. Impacting these coatings requires compliance with applicable Federal and State regulatory lead regulations.

### 4.2 RECOMMENDATIONS

- **Regulated Coatings:** Any coating that contains lead above 1.0 mg/cm<sup>2</sup> by XRF or a measurable amount of lead above the limit of detection by Flame AA Analysis (0.01% by weight), and is to be included in a demolition, renovation or abatement activity is required to be handled as a regulated lead containing material. Contractors or employees working with these coatings or uncharacterized suspect coatings must:
  - Identify lead containing materials,
  - Provide lead training for employees,
  - Enroll affected employees in a medical surveillance monitoring program,
  - Provide appropriate decontamination facilities to affected employees,
  - Prepare proper demarcation of effected work areas,
  - Provide appropriate personal protective equipment (PPE),
  - Conduct initial exposure assessment air monitoring for all affected employees,
  - Conduct ongoing or periodic exposure assessment air monitoring while working with leaded materials.
- Any debris generated from impacting the identified regulated lead containing coatings must be assumed to be hazardous waste until properly characterized by toxic characteristic leaching procedure (TCLP) sampling and analysis to determine proper waste disposition.



The following methods should be considered prohibited when implementing demolition/ renovation measures: uncontained abrasive, sand, or water blasting; power sanding; or open flame burning of lead based paint coated surfaces.

#### **4.3 ESTIMATE OF REMEDIATION COSTS**

Mountain Consulting was not provided with enough project specific information to provide a valid cost estimate for this project. Assuming that just the tie in points will require abatement for the attachment of fall protection and assuming that the abatement can be completed in one day with two workers; then the estimated abatement cost would be \$ 2,500.00 to \$ 3, 500.00.

### **5.0 LIMITING CONDITIONS AND CLOSURE**

#### **5.1 LIMITING CONDITIONS**

We have exercised reasonable efforts to accomplish the tasks for this project using current professional standards of the industry. To the extent that the services require subjective judgment, there can be no assurance that definitive or desired results have been obtained or that they will be usable. Although based on scientific principles, to the extent that results depend on subjective judgment, they are subject to human error.

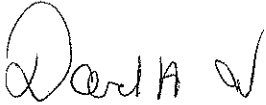
#### **5.2 CLOSURE**

The results, conclusions, and recommendations in this report were prepared following our inspection of identified suspect LBP at the subject property. Methods used by Mountain Consulting for this study are consistent with the standard of care and professionalism normally exercised by consultants in environmental science and engineering. The Client acknowledges that Mountain Consulting has been retained for the sole purpose of helping the Client to identify LBP, if any, associated with the subject structure(s).

This report was prepared for the exclusive use of the 92<sup>nd</sup> CES/CEOE, Fairchild Air Force Base, Washington and/or representatives thereof. It may only be reproduced in full and with written approval of Mountain Consulting and is not warranted if any portion of it is separated from the original complete document.

## STATEMENT OF PROFESSIONALISM

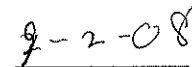
Mountain Consulting Services, LLC, hereby certify that, to the best of our knowledge and ability, the limited lead based paint survey performed for Building 2050 hangers 1 and 3 located on Fairchild Air Force Base in Airway Heights, Washington 99011, reflects the true lead content of identified painted surfaces for this project.



David A. Jones

Certified EPA/WA ST Lead Risk Assessor

Certificate Number: WA 0567



Date

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## **APPENDIX A INSPECTOR CERTIFICATIONS**

# STATE OF WASHINGTON

Department of Community, Trade and Economic Development  
Lead-Based Paint Program

**David Jones**

Has fulfilled the certification requirements of Washington Administrative code (WAC) 365-230 and has been certified to conduct lead-based paint activities pursuant to WAC 365-230-200 as a:

**Risk Assessor**

Certification #	Issuance Date	Expiration Date
0567	2/16/2007	2/16/2010

# STATE OF WASHINGTON

Department of Community, Trade and Economic Development  
Lead-Based Paint Program

**David Jones**

Has fulfilled the certification requirements of Washington Administrative code (WAC) 365-230 and has been certified to conduct lead-based paint activities pursuant to WAC 365-230-200 as a:

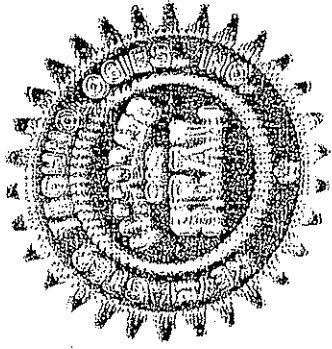
Inspector

Certification #	Issuance Date	Expiration Date
0567	2/16/2007	2/16/2010



# KeyMaster

TECHNOLOGIES  
INC

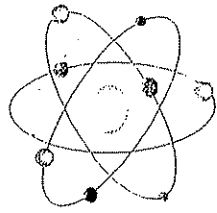


This is to certify that  
David A. Jones

Has successfully completed a course of instruction in the safe operation of Gamma sourced portable XRF Devices manufactured by KeyMaster Technologies, Inc. This course covered Fundamentals of Radiation, State Licensing Regulation, Principles of XRF, Safety Regulations, and Environmental Sampling Theory.

Date: February 16, 2007

Operator's Number: 8153



BASIC RADIATION SAFETY

*Jim Dally*

Authorized Signature

# State of Idaho Division of Environmental Quality

David A. Jones

has fulfilled the requirements of the Toxic Substances Control Act (TSCA) Section 402(a)(1), and has received certification to conduct lead-based paint activities pursuant to 40 CFR Part 745.226 as a:

Risk Assessor

## The Junction

Idaho

This certification is valid from the date of issuance and expires March 2, 2010

ID-R-14998-1

Certification #

February 16, 2007

Issued On



Christina Colt, Unit Manager, Solid Waste and Toxics  
Office of Air, Waste and Toxics

# **STATE OF WASHINGTON**

Department of Community, Trade and Economic Development  
Lead-Based Paint Program

## **Mountain Consulting Services, LLC**

*Has fulfilled the certification requirements of Washington Administrative  
code (WAC) 365-230 and has been certified to conduct lead-based paint  
activities pursuant to WAC 365-230-200.*

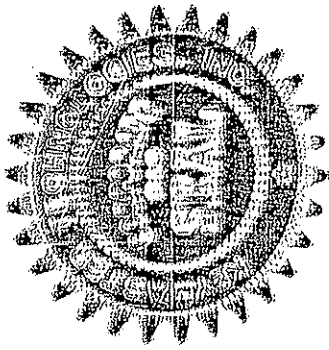
Certification #	Issuance Date	Expiration Date
0167	2/28/2008	4/2/2010





# KeyMaster

INSTRUMENTS  
INC.



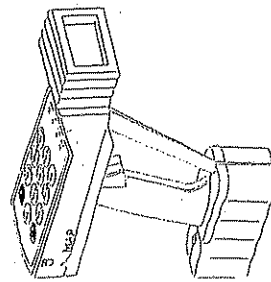
This is to certify that  
David A. Jones

has successfully completed a course of instruction in Basic MAP 4 Operations. This course covered Advanced Report Manager Coding, Sampling Practices and Protocols, XRF Field Testing, Acutransfer Operations and "MAP 4" Operations.

Date: March 9, 2007

Operator's Number: 8164

MAP 4



XRF OPERATOR

Authorized Signature

**APPENDIX B  
XRF SURVEY DATA  
AND CALIBRATION WORKSHEET**

Mountain Consulting Services LLC  
9922 East Montgomery Drive  
Suite 9  
Spokane Valley WA 99206-4190

## General XRF Results

Customer: FAFB 92nd CES/CEOE  
100 W. Ent St.  
Fairchild AFB, WA 99011

Project Name: Building 2050  
Hanger 1 and 3

Site Name: Hanger 1 and 3

Action Level 1,000 mg/cm2 Lab 1,000 mg/cm2

Total Assays Reported

13

#	Site	Room Tested	#	Wall	Component	Substrate	Paint Condition	K-Shell mg/cm2	L-Shell mg/cm2	Map #	Lab	Result
27261	0001	Calibration	*	*	*	*	*	0.000 X	0.000 X	0		
27262	0001	Hanger	1	North	Truss	Metal	Intact	4.601 K	1.228 L	0		Pos
27263	0001	Hanger	1	North	Truss	Metal	Intact	4.938 K	1.243 L	0		Pos
27264	0001	Hanger	1	North	Post	Metal	Intact	8.363 K	1.452 L	0		Pos
27265	0001	Hanger	1	South	Post	Metal	Intact	7.154 K	1.273 L	0		Pos
27266	0001	Hanger	1	South	Truss	Metal	Intact	8.425 K	1.489 L	0		Pos
27267	0001	Hanger	1	South	Post	Metal	Intact	6.049 K	0.897 L	0		Pos
27268	0001	Hanger	1	East	Post	Metal	Intact	6.025 K	0.446 L	0		Pos
27269	0001	Calibration	*	*	*	*	*	0.940 K	0.984 L	299		Incl
27270	0001	Calibration	*	*	*	*	*	1.020 K	0.975 L	299		Incl
27271	0001	Calibration	*	*	*	*	*	0.905 K	0.903 L	299		Incl
27272	0001	Calibration	*	*	*	*	*	1.047 K	0.874 L	299		Incl
27273	0001	Calibration	*	*	*	*	*	1.023 K	1.055 L	299		Incl

# MAP4 DAILY CALIBRATION CHECK SAMPLE WORKSHEET

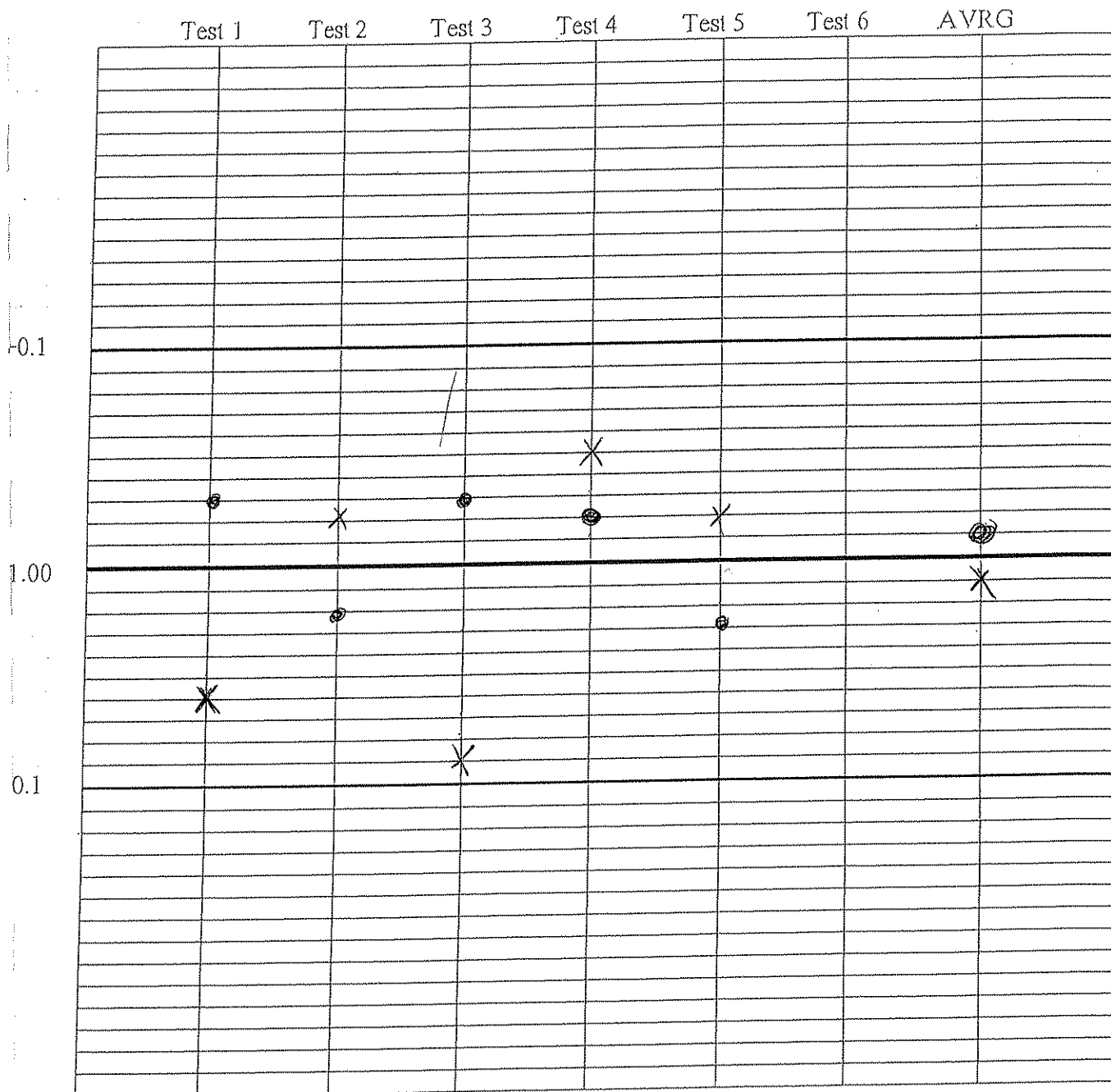
MAP4 Serial Number - M41299

Location FAFB Bv. 10, r 2050

Factory Calibration Average - 1.00 mg/cm<sup>2</sup>

Job Number 508-006.32 Site 0001

DATE	TIME	TEST 1	TEST 2	TEST 3	TEST 4	TEST 5	TEST 6	AVERAGE
8-27-08	1000 AM	1.03	0.98	1.03	1.02	0.97		1.006
8-27-08	235 PM	0.94	1.02	0.91	1.05	1.02		0.988



MAP Customer Number: 5021

XRF Project Number: 0632

## **APPENDIX C**

### **XRF HUD DATA (DEPICTING PAINT COLORS)**

Mountain Consulting Services LLC  
9922 East Montgomery Drive  
Suite 9  
Spokane Valley WA 99206-4190

## Single Family HUD Data Sheet

Customer: FAFB 92nd CES/CEOE  
100 W. Ent St.  
Fairchild AFB, WA 99011

Project Name: Building 2050  
Hanger 1 and 3

Site Name: Hanger 1 and 3

Action Level 1,000 mg/cm2 Lab 1,000 mg/cm2

Total Assays Reported

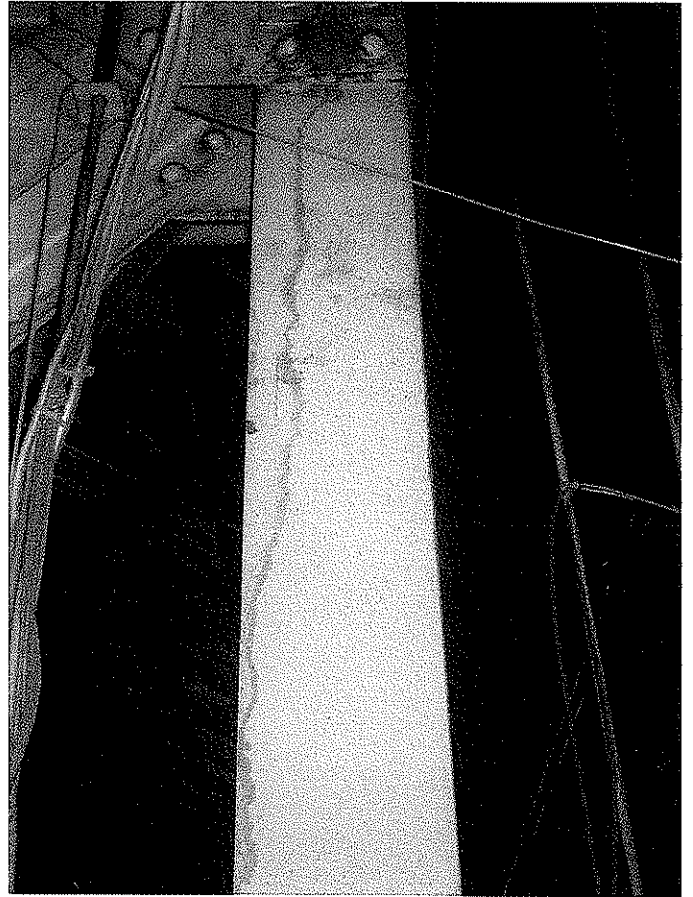
7

Map #	Room Tested	#	Grp	Wall	Component	Substrate	Paint Color	Paint Cond	K-Shell mg/cm2	Average	Lab	Result
0	Hanger	1	(GX)	East	Post	Metal	White	Intact	6.025 K	6.898		Pos
0	Hanger	1	(GX)	North	Post	Metal	Green	Intact	8.363 K			Pos
0	Hanger	1	(GX)	South	Post	Metal	Green	Intact	7.154 K			
0	Hanger	1	(GX)	South	Post	Metal	Brown	Intact	6.049 K			Pos
0	Hanger	1	(GX)	North	Truss	Metal	Green	Intact	4.938 K	5.988		Pos
0	Hanger	1	(GX)	South	Truss	Metal	Green	Intact	8.425 K			
0	Hanger	1	(GX)	North	Truss	Metal	Brown	Intact	4.601 K			Pos

## **APPENDIX D SITE PHOTOS**



**METAL TRUSSES**



**METAL SUPPORT BEAMS SHOWING GREEN AND BROWN  
PAINT TESTED**



## **APPENDIX E HEALTH EFFECTS OF LEAD**

